#15

SEQUENCE LISTING

<110> Kingsbury, G.
Leiby, K.

<120> COMPOSITIONS AND METHODS FOR THE DIAGNOSIS AND TREATMENT OF IMMUNE DISORDERS

<130> MPI99-131P1RNDV1AM

<140> 09/899,980
<141> 2001-07-06

<150> 60/155,862
<151> 1999-09-24

<160> 34

<170> FastSEQ for Windows Version 3.0

<210> 1
<211> 255
<212> DNA
<213> Homo sapiens

<400> 1
ttagcgccat tgccatagag agacctcagc catcaatcac tagcacatga ttgacagaca 60
gagaatggga ctttgggctt tggcaattct gacacttccc atgtatttga cagttacgga 120
gggcagtaaa tcgtcctggg gtctggaaaa tgaggcttta attgtgagat gcccccaaag 180
aggacgctcg acttatcctg tggaatggta ttactcagat acaaatgaaa gtattcctac 240
ccaaaaaaaa aaaaa 255

<210> 2
<211> 1011
<212> DNA
<213> Mus musculus

<400> 2
atgattgaca gacagagaat gggactttgg gctttggcaa ttctgacact tcccatgtat 60
ttgacagtta cggagggcag taaatcgtcc tggggtctgg aaaatgaggc tttaattgtg 120
agatgccccc aaagaggacg ctcgacttat cctgtggaat ggtattactc agatacaaat 180
gaaagtattc ctactcaaaa aagaaatcgg atctttgtct caagagatcg tctgaagttt 240
ctaccagcca gagtcgaaga ctctgggatt tatgcttgtg ttatcagaag ccccaacttg 300
aataagactg gatacttgaa tgtcaccata cataaaaagc cgccaagctg caatatccct 360
gattatttga tgtactcgac agtacgtgga tcagataaaa atttcaagat aagctgtcca 420
acaattgacc tgtataattg gacagcacct gttcagtggt ttaagaactg caaagctctc 480
caagagccaa ggttcagggc acacaggtcc tacttgttca ttgacaacgt gactcatgat 540
gatgaaggtg actacacttg tcaattcaca cacgcggaga atggaaccaa ctacatcgtg 600
acggccacca gatcattcac agttgaagaa aaaggctttt ctatgtttcc agtaattaca 660
aatcctccat acaaccacac aatggaagtg gaaataggaa aaccagcaag tattgcctgt 720
tcagcttgct ttggcaaagg ctctcacttc ttggctgatg tcctgtggca gattaacaaa 780
acagtagttg gaaattttgg tgaagcaaga attcaagaag aggaaggtcg aaatgaaagt 840
tccagcaatg acatggattg tttaacctca gtgttaagga taactggtgt gacagaaaag 900
gacctgtccc tggaatatga ctgtctggcc ctgaaccttc atggcatgat aaggcacacc 960
ataaggctga gaaggaaaca accaagtaag gagtgtccct cacacattgc t 1011

<210> 3
<211> 4989
<212> DNA
<213> Mus musculus

<400> 3

tgccattgcc atagagagac ctcagccatc aatcactagc acatgattga cagacagaga 60
atgggacttt gggctttggc aattctgaca cttcccatgt atttgacagt tacggagggc 120
agtaaatcgt cctggggtct ggaaaatgag gctttaattg tgagatgccc ccaaagagga 180
cgctcgactt atcctgtgga atggtattac tcagatacaa atgaaagtat tcctactcaa 240
aaaagaaatc ggatctttgt ctcaagagat cgtctgaagt ttctaccagc cagagtggaa 300
gactctggga tttatgcttg tgttatcaga agccccaact tgaataagac tggatacttg 360
aatgtcacca tacataaaaa gccgccaagc tgcaatatcc ctgattattt gatgtactcg 420
acagtacgtg gatcagataa aaatttcaag ataacgtgtc caacaattga cctgtataat 480
tggacagcac ctgttcagtg gtttaagaac tgcaaagctc tccaagagcc aaggttcagg 540
gcacacaggt cctacttgtt cattgacaac gtgactcatg atgatgaagg tgactacact 600
tgtcaattca cacacgcgga gaatggaacc aactacatcg tgacggccac cagatcattc 660
acagttgaag aaaaaggctt ttctatgttt ccagtaatta caaatcctcc atacaaccac 720
acaatggaag tggaaatagg aaaaccagca agtattgcct gttcagcttg ctttggcaaa 780
ggctctcact tcttggctga tgtcctgtgg cagattaaca aaacagtagt tggaaatttt 840
ggtgaagcaa gaattcaaga agaggaaggt cgaaatgaaa gttccagcaa tgacatggat 900
tgtttaacct cagtgttaag gataactggt gtgacagaaa aggacctgtc cctggaatat 960
gactgtctgg ccctgaacct tcatggcatg ataaggcaca ccataaggct gagaaggaaa 1020
caaccaattg atcaccgaag catctactac atagttgctg gatgtagttt attgctaatg 1080
tttatcaatg tcttggtgat agtcttaaaa gtgttctgga ttgaggttgc tctgttctgg 1140
agagatatag tgacacctta caaaacccgg aacgatggca agctctacga tgcgtacatc 1200
atttaccctc gggtcttccg gggcagcgcg gcgggaaccc actctgtgga gtactttgtt 1260
caccacactc tgcccgacgt tcttgaaaat aaatgtggct acaaattgtg catttatggg 1320
agagacctgt tacctgggca agatgcagcc accgtggtgg aaagcagtat ccagaatagc 1380
agaagacagg tgtttgttct ggcccctcac atgatgcaca gcaaggaatt tgcctacgag 1440
caggagattg ctctgcacag cgccctcatc cagaacaact ccaaggtgat tcttattgaa 1500
atggagcctc tgggtgaggc aagccgacta caggttgggg acctgcaaga ttctctccag 1560
catcttgtga aaattcaggg gaccatcaag tggagggaag atcatgtggc cgacaagcag 1620
tctctaagtt ccaaattctg gaagcatgtg aggtaccaaa tgccagtgcc agaaagagcc 1680
tccaagacgg catctgttgc ggctccgttg agtggcaagg catgcttaga cctgaaacac 1740
ttttgagttg agagctgcgg agtcccagca gtaggcaccg gagtgcaggt gtgcagactt 1800
gaaatgccaa gggtgggggc cccaagtctc agctaaagag caactctagt ttattttcct 1860
ggttatggta ggagccaccc atcgtttgtt tccggtttcc ttttcctact tcactcttgt 1920
ggcacaagat caaccctgag ctttttcctt ttcttttatt tctcttttg ttccttcttt 1980
taaaagcttt ttaaaattga ttatcttatt tatctacctt tcaaaggtta tccccccttcc 2040
cggtgccccc tctacaaatc cccatcctgc ttccctcctc cctgcttcta tgagggtgcc 2100
cccccacctg cccatccact ccagccttac aggccttgtg ttcccctatg ctggggcatc 2160
gagcctccat aagacctccc ctctcattca tcaattatct acattctgaa tatcaagccg 2220
acacttttgt ttttgttttt gatttttga gacagggttt ctctgtgtag ccctggctgt 2280
cttgaaactc acattgtaga ccaggctggc ctcgaactca gaaatcagcc tgcctctgcc 2340
tccccgagtg ctgggattaa aggcgtgcgc caccacgccg ggctaagcct acactttcag 2400
aataaagttc tgattcacct caaagagcag tctcattccc agaggcagag agccggaaag 2460
agcctccaat gtgcttgtcc aggcagagct gaccttattt gcttaccagt cacaggtaaa 2520
caaagcgttt ctccgtgttg cctcttgtag acatccctgt aatagattag gaagggaatg 2580
agccgtccta ctgaccagtt tgtgaattgt ggtagaaaaa gcgttgacgt ttgttaaata 2640
cttgttagca atgtaaacct cattcctaac acaccagaat ttcttacttt ttattcgtca 2700
attaccgagt tttgtcaagt cagtattaac agatttggtc gaatacctta cccaaattgc 2760
cattacagtc gagcatgttt tcagttctaa atgcctttta tatatttttt attcttctta 2820
gaaatacttc ctcactttaa aagtaatgta aagatgtgtt agaaaacata aggtgtaaga 2880
gaaagtatga taaaatataa aaaataatag aaaggaaagg aaatataatg aaaatcataa 2940
ctcttaagat taattttggt aggtctgtat tttaaaatat aattaaattt tataccgata 3000
acttttatag ctgagattgt acactacaga ctaggcagct tttcctattt accaccataa 3060
tgaaaactgg tggctgattt ctttaacatt cacagaagtt ccaaatgtct cattttagac 3120
tgtgctgcag actatggctg aagcagccag aatgagaaac aggtctgcca tgtcacatcg 3180
ggacattttc ctacttactg aaatgtatct gtcactgtgc gacagctaac ttttgtgata 3240
ctcctatgaa atgtgtaggg aatttggaca gaacagaatc aatctatagt cagaggtcct 3300
ctggacagtc ttttccagga gcacacacag accgtgaggt cctaggcacc caggaaacgg 3360
atccagagcc caggcaagtg tcttacaggt accttgaatt ttgccaatag atatgagccc 3420
tgccttagct gagttgctca gtcggtgatg ggactccagg ctgaggtgac aatgaacaca 3480
gaatttggga gactcttgaa aggaggggaa tgttgaactc acggtcaaca tatgaggctg 3540

cagagaagcc gtatgcagaa gtgtgtgtag aggatctaga gtagcccgtt tctctgggga 3600
cagtgtgctc ttagtctgta cccttaggct gggttgccag gtaaacattt gctagtgttc 3660
agttcaaagg ctgaagcttg agctgagggt gatgaggaat tcaaacttcc cctcgcatgc 3720
atccaccctg tggttgcctg gtttgctaag tccacctgct ctgctgtagt agaaggtttt 3780
gatcttctgc agcttcatct acttcttagt gagttgccaa aactgaccac tgaaaagcat 3840
gctgtgtaca taactgtctc atgtcccaga acgtgcaatc aggaggaagt cctcactccc 3900
gataacggaa tccttgctct gtggctgtga ggacgtccct tagcaacctc agatagtaat 3960
ttttcttagg ttggatggaa catagtaacg tgctggattc tttgctaact gaaaatagaa 4020
gtattcggat ttcagaaaga actggataaa tattaatgtt ggtgattatg aaatctcatt 4080
gtgagccgtg tgagtttgag tgtgtattcc atgattgtgc tgaatgaaga cctctaaaaa 4140
tgaaattctc tccaatctca tccctgggaa tagttgcttc ctcatgcctg ctgctccatc 4200
catggaaaat gactaaagag aattattatt tgttcccgag attcttctga taagtctaaa 4260
ctatttgcat gtaattgagc tgggcagcat ggcacacttg ggaggcagag gcaggtggat 4320
ctctgtgagt ttgaggccag cctgctctac agagttagtt ccaggacacc agagctacaa 4380
aaagaaaacc tgtcctaaca acaacagcaa cagctgcagc agcaacaaca acaacaaaga 4440
aaaagaagag gaggaggagg aaaggaaaga aggaagaagg aagaagaaag ggaagaaata 4500
atagattttt ctgtaatgaa cacacatatg ctttgatgct tttgctaaac tcaaaatatt 4560
agttttattt tactgttttg aaaggttcaa agcatgatcc atgtaaaaat gtcttctgtg 4620
gggctttctc ccatttctac ttttgttccc ctcatttctt caaagtgctt gtccaggcag 4680
agctgacctt atttgcttac cagttacagg taaacaaagc gtttcctcgt gttgcctctt 4740
gtagccatct ctgtattaga ttaggaaggg aaggagccgt cctactgtcc agtttgtgag 4800
ttctggtaga aagagtgttg aagtttgtta aatgcttgtt ttccatgtat caaaatgtta 4860
tgcctttcct atttattatt gtatgacaaa ttatttttca ctgggcaaaa ataattgtgc 4920
cattgactcc ttgtgtgttt tcttcatgtg tgtttgaaga gttctagctt attaaaaaaa 4980
aaaatctag 4989

<210> 4
<211> 2058
<212> DNA
<213> Homo sapiens

<400> 4
aaagagaggc tggctgttgt atttagtaaa gctataaagc tgtaagagaa attggctttc 60
tgagttgtga aactgtgggc agaaagttga ggaagaaaga actcaagtac aacccaatga 120
ggttgagata taggctactc ttcccaactc agtcttgaag agtatcacca actgcctcat 180
gtgtggtgac cttcactgtc gtatgccagt gactcatctg gagtaatctc aacaacgagt 240
taccaatact tgctcttgat tgataaacag aatggggttt tggatcttag caattctcac 300
aattctcatg tattccacag cagcaaagtt tagtaaacaa tcatggggcc tggaaaatga 360
ggctttaatt gtaagatgtc ctagacaagg aaaacctagt tacaccgtgg attggtatta 420
ctcacaaaca aacaaaagta ttcccactca ggaaagaaat cgtgtgtttg cctcaggcca 480
acttctgaag tttctaccag ctgaagttgc tgattctggt atttatacct gtattgtcag 540
aagtcccaca ttcaatagga ctggatatgc gaatgtcacc atatataaaa aacaatcaga 600
ttgcaatgtt ccagattatt tgatgtattc aacagtatct ggatcagaaa aaaattccaa 660
aatttattgt cctaccattg acctctacaa ctggacagca cctcttgagt ggtttaagaa 720
ttgtcaggct cttcaaggat caaggtacag ggcgcacaag tcatttttgg tcattgataa 780
tgtgatgact gaggacgcag gtgattacac ctgtaaattt atacacaatg aaaatggagc 840
caattatagt gtgacggcga ccaggtcctt cacggtcaag gatgagcaag gcttttctct 900
gtttccagta atcggagccc ctgcacaaaa tgaaataaag gaagtggaaa ttggaaaaaa 960
cgcaaaccta acttgctctg cttgttttgg aaaaggcact cagttcttgg ctgccgtcct 1020
gtggcagctt aatggaacaa aaattacaga ctttggtgaa ccaagaattc aacaagagga 1080
agggcaaaat caaagtttca gcaatgggct ggcttgtcta gacatggttt taagaatagc 1140
tgacgtgaag gaagaggatt tattgctgca gtacgactgt ctggccctga atttgcatgg 1200
cttgagaagg cacaccgtaa gactaagtag gaaaaatcca attgatcatc atagcatcta 1260
ctgcataatt gcagtatgta gtgtattttt aatgctaatc aatgtcctgg ttatcatcct 1320
aaaaatgttc tggattgagg ccactctgct ctggagagac atagctaaac cttacaagac 1380
taggaatgat ggaaagctct atgatgctta tgttgtctac ccacggaact acaaatccag 1440
tacagatggg gccagtcgtg tagagcactt tgttcaccag attctgcctg atgttcttga 1500
aaataaatgt ggctatacct tatgcattta tgggagagat atgctacctg gagaagatgt 1560
agtcactgca gtggaaacca acatacgaaa gagcaggcgg cacattttca tcctgacccc 1620
tcagatcact cacaataagg agtttgccta cgagcaggag gttgccctgc actgtgccct 1680
catccagaac gacgccaagg tgatacttat tgagatggag gctctgagcg agctggacat 1740

```
gctgcaggct gaggcgcttc aggactccct ccagcatctt atgaaagtac aggggaccat    1800
caagtggagg gaggaccaca ttgccaataa aaggtccctg aattccaaat tctggaagca    1860
cgtgaggtac caaatgcctg tgccaagcaa aattcccaga aaggcctcta gtttgactcc    1920
cttggctgcc cagaagcaat agtgcctgct gtgatgtgca aagggatctg ggtttgaagc    1980
tttcctgact tctcctagct ggcttatgcc cctgcactga agtgtgagga gcgggaatat    2040
taaagggatt caggccac                                                  2058
```

<210> 5
<211> 1357
<212> DNA
<213> Homo sapiens

<400> 5

```
atctcaacaa cgagttacca atacttgctc ttgattgata aacagaatgg ggttttggat      60
cttagcaatt ctcacaattc tcatgtattc cacagcagca aagtttagta aacaatcatg     120
gggcctggaa aatgaggctt taattgtaag atgtcctaga caaggaaaac ctagttacac     180
cgtggattgg tattactcac aaacaaacaa aagtattccc actcaggaaa gaaatcgtgt     240
gtttgcctca ggccaacttc tgaagtttct accagctgaa gttgctgatt ctggtattta     300
tacctgtatt gtcagaagtc ccacattcaa taggactgga tatgcgaatg tcaccatata     360
taaaaaacaa tcagattgca atgttccaga ttatttgatg tattcaacag tatctggatc     420
agaaaaaaat tccaaaattt attgtcctac cattgacctc tacaactgga cagcacctct     480
tgagtggttt aagaattgtc aggctcttca aggatcaagg tacagggcgc acaagtcatt     540
tttggtcatt gataatgtga tgactgagga cgcaggtgat tacacctgta aatttataca     600
caatgaaaat ggagccaatt atagtgtgac ggcgaccagg tccttcacgg tcaaggatga     660
gcaaggcttt tctctgtttc cagtaatcgg agcccctgca caaaatgaaa taaaggaagt     720
ggaaattgga aaaaacgcaa acctaacttg ctctgcttgt tttggaaaag gcactcagtt     780
cttggctgcc gtcctgtggc agcttaatgg aacaaaaatt acagactttg gtgaaccaag     840
aattcaacaa gaggaagggc aaaatcaaag tttcagcaat gggctggctt gtctagacat     900
ggttttaaga atagctgacg tgaaggaaga ggatttattg ctgcagtacg actgtctggc     960
cctgaatttg catggcttga gaaggcacac cgtaagacta agtaggaaaa atccaagtaa    1020
ggagtgtttc tgagactttg atcacctgaa ctttctctag caagtgtaag cagaatggag    1080
tgtggttcca agagatccat caagacaatg ggaatggcct gtgccataaa atgtgcttct    1140
cttcttcggg atgttgtttg ctgtctgatc tttgtagact gttcctgttt gctgggagct    1200
tctctgctgc ttaaattgtt cgtcctcccc cactccctcc tatcgttggt ttgtctagaa    1260
cactcagctg cttctttggt catccttgtt ttctaacttt atgaactccc tctgtgtcac    1320
tgtatgtgaa aggaaatgca ccaacaaccg aaaactg                              1357
```

<210> 6
<211> 337
<212> PRT
<213> Mus musculus

<400> 6

```
Met Ile Asp Arg Gln Arg Met Gly Leu Trp Ala Leu Ala Ile Leu Thr
 1               5                  10                  15
Leu Pro Met Tyr Leu Thr Val Thr Glu Gly Ser Lys Ser Ser Trp Gly
            20                  25                  30
Leu Glu Asn Glu Ala Leu Ile Val Arg Cys Pro Gln Arg Gly Arg Ser
        35                  40                  45
Thr Tyr Pro Val Glu Trp Tyr Tyr Ser Asp Thr Asn Glu Ser Ile Pro
    50                  55                  60
Thr Gln Lys Arg Asn Arg Ile Phe Val Ser Arg Asp Arg Leu Lys Phe
65                  70                  75                  80
Leu Pro Ala Arg Val Glu Asp Ser Gly Ile Tyr Ala Cys Val Ile Arg
                85                  90                  95
Ser Pro Asn Leu Asn Lys Thr Gly Tyr Leu Asn Val Thr Ile His Lys
            100                 105                 110
Lys Pro Pro Ser Cys Asn Ile Pro Asp Tyr Leu Met Tyr Ser Thr Val
        115                 120                 125
Arg Gly Ser Asp Lys Asn Phe Lys Ile Thr Cys Pro Thr Ile Asp Leu
    130                 135                 140
```

```
Tyr Asn Trp Thr Ala Pro Val Gln Trp Phe Lys Asn Cys Lys Ala Leu
145                 150                 155                 160
Gln Glu Pro Arg Phe Arg Ala His Arg Ser Tyr Leu Phe Ile Asp Asn
                165                 170                 175
Val Thr His Asp Asp Glu Gly Asp Tyr Thr Cys Gln Phe Thr His Ala
            180                 185                 190
Glu Asn Gly Thr Asn Tyr Ile Val Thr Ala Thr Arg Ser Phe Thr Val
        195                 200                 205
Glu Glu Lys Gly Phe Ser Met Phe Pro Val Ile Thr Asn Pro Pro Tyr
    210                 215                 220
Asn His Thr Met Glu Val Glu Ile Gly Lys Pro Ala Ser Ile Ala Cys
225                 230                 235                 240
Ser Ala Cys Phe Gly Lys Gly Ser His Phe Leu Ala Asp Val Leu Trp
                245                 250                 255
Gln Ile Asn Lys Thr Val Val Gly Asn Phe Gly Glu Ala Arg Ile Gln
            260                 265                 270
Glu Glu Glu Gly Arg Asn Glu Ser Ser Ser Asn Asp Met Asp Cys Leu
        275                 280                 285
Thr Ser Val Leu Arg Ile Thr Gly Val Thr Glu Lys Asp Leu Ser Leu
    290                 295                 300
Glu Tyr Asp Cys Leu Ala Leu Asn Leu His Gly Met Ile Arg His Thr
305                 310                 315                 320
Ile Arg Leu Arg Arg Lys Gln Pro Ser Lys Glu Cys Pro Ser His Ile
                325                 330                 335
Ala
```

<210> 7
<211> 567
<212> PRT
<213> Mus musculus

<400> 7

```
Met Ile Asp Arg Gln Arg Met Gly Leu Trp Ala Leu Ala Ile Leu Thr
 1               5                  10                  15
Leu Pro Met Tyr Leu Thr Val Thr Glu Gly Ser Lys Ser Ser Trp Gly
            20                  25                  30
Leu Glu Asn Glu Ala Leu Ile Val Arg Cys Pro Gln Arg Gly Arg Ser
        35                  40                  45
Thr Tyr Pro Val Glu Trp Tyr Tyr Ser Asp Thr Asn Glu Ser Ile Pro
    50                  55                  60
Thr Gln Lys Arg Asn Arg Ile Phe Val Ser Arg Asp Arg Leu Lys Phe
65                  70                  75                  80
Leu Pro Ala Arg Val Glu Asp Ser Gly Ile Tyr Ala Cys Val Ile Arg
                85                  90                  95
Ser Pro Asn Leu Asn Lys Thr Gly Tyr Leu Asn Val Thr Ile His Lys
            100                 105                 110
Lys Pro Pro Ser Cys Asn Ile Pro Asp Tyr Leu Met Tyr Ser Thr Val
        115                 120                 125
Arg Gly Ser Asp Lys Asn Phe Lys Ile Thr Cys Pro Thr Ile Asp Leu
    130                 135                 140
Tyr Asn Trp Thr Ala Pro Val Gln Trp Phe Lys Asn Cys Lys Ala Leu
145                 150                 155                 160
Gln Glu Pro Arg Phe Arg Ala His Arg Ser Tyr Leu Phe Ile Asp Asn
                165                 170                 175
Val Thr His Asp Asp Glu Gly Asp Tyr Thr Cys Gln Phe Thr His Ala
            180                 185                 190
Glu Asn Gly Thr Asn Tyr Ile Val Thr Ala Thr Arg Ser Phe Thr Val
        195                 200                 205
Glu Glu Lys Gly Phe Ser Met Phe Pro Val Ile Thr Asn Pro Pro Tyr
    210                 215                 220
```

```
Asn His Thr Met Glu Val Glu Ile Gly Lys Pro Ala Ser Ile Ala Cys
225                 230                 235                 240
Ser Ala Cys Phe Gly Lys Gly Ser His Phe Leu Ala Asp Val Leu Trp
                245                 250                 255
Gln Ile Asn Lys Thr Val Val Gly Asn Phe Gly Glu Ala Arg Ile Gln
            260                 265                 270
Glu Glu Glu Gly Arg Asn Glu Ser Ser Ser Asn Asp Met Asp Cys Leu
        275                 280                 285
Thr Ser Val Leu Arg Ile Thr Gly Val Thr Glu Lys Asp Leu Ser Leu
    290                 295                 300
Glu Tyr Asp Cys Leu Ala Leu Asn Leu His Gly Met Ile Arg His Thr
305                 310                 315                 320
Ile Arg Leu Arg Arg Lys Gln Pro Ile Asp His Arg Ser Ile Tyr Tyr
                325                 330                 335
Ile Val Ala Gly Cys Ser Leu Leu Leu Met Phe Ile Asn Val Leu Val
            340                 345                 350
Ile Val Leu Lys Val Phe Trp Ile Glu Val Ala Leu Phe Trp Arg Asp
        355                 360                 365
Ile Val Thr Pro Tyr Lys Thr Arg Asn Asp Gly Lys Leu Tyr Asp Ala
    370                 375                 380
Tyr Ile Ile Tyr Pro Arg Val Phe Arg Gly Ser Ala Ala Gly Thr His
385                 390                 395                 400
Ser Val Glu Tyr Phe Val His His Thr Leu Pro Asp Val Leu Glu Asn
                405                 410                 415
Lys Cys Gly Tyr Lys Leu Cys Ile Tyr Gly Arg Asp Leu Leu Pro Gly
            420                 425                 430
Gln Asp Ala Ala Thr Val Val Glu Ser Ser Ile Gln Asn Ser Arg Arg
        435                 440                 445
Gln Val Phe Val Leu Ala Pro His Met Met His Ser Lys Glu Phe Ala
    450                 455                 460
Tyr Glu Gln Glu Ile Ala Leu His Ser Ala Leu Ile Gln Asn Asn Ser
465                 470                 475                 480
Lys Val Ile Leu Ile Glu Met Glu Pro Leu Gly Glu Ala Ser Arg Leu
                485                 490                 495
Gln Val Gly Asp Leu Gln Asp Ser Leu Gln His Leu Val Lys Ile Gln
            500                 505                 510
Gly Thr Ile Lys Trp Arg Glu Asp His Val Ala Asp Lys Gln Ser Leu
        515                 520                 525
Ser Ser Lys Phe Trp Lys His Val Arg Tyr Gln Met Pro Val Pro Glu
    530                 535                 540
Arg Ala Ser Lys Thr Ala Ser Val Ala Ala Pro Leu Ser Gly Lys Ala
545                 550                 555                 560
Cys Leu Asp Leu Lys His Phe
                565
```

<210> 8
<211> 556
<212> PRT
<213> Homo sapiens

<400> 8

```
Met Gly Phe Trp Ile Leu Ala Ile Leu Thr Ile Leu Met Tyr Ser Thr
 1               5                  10                  15
Ala Ala Lys Phe Ser Lys Gln Ser Trp Gly Leu Glu Asn Glu Ala Leu
            20                  25                  30
Ile Val Arg Cys Pro Arg Gln Gly Lys Pro Ser Tyr Thr Val Asp Trp
        35                  40                  45
Tyr Tyr Ser Gln Thr Asn Lys Ser Ile Pro Thr Gln Glu Arg Asn Arg
    50                  55                  60
Val Phe Ala Ser Gly Gln Leu Leu Lys Phe Leu Pro Ala Glu Val Ala
65                  70                  75                  80
```

```
Asp Ser Gly Ile Tyr Thr Cys Ile Val Arg Ser Pro Thr Phe Asn Arg
                  85                  90                  95
Thr Gly Tyr Ala Asn Val Thr Ile Tyr Lys Lys Gln Ser Asp Cys Asn
             100                 105                 110
Val Pro Asp Tyr Leu Met Tyr Ser Thr Val Ser Gly Ser Glu Lys Asn
         115                 120                 125
Ser Lys Ile Tyr Cys Pro Thr Ile Asp Leu Tyr Asn Trp Thr Ala Pro
     130                 135                 140
Leu Glu Trp Phe Lys Asn Cys Gln Ala Leu Gln Gly Ser Arg Tyr Arg
145                 150                 155                 160
Ala His Lys Ser Phe Leu Val Ile Asp Asn Val Met Thr Glu Asp Ala
                 165                 170                 175
Gly Asp Tyr Thr Cys Lys Phe Ile His Asn Glu Asn Gly Ala Asn Tyr
             180                 185                 190
Ser Val Thr Ala Thr Arg Ser Phe Thr Val Lys Asp Glu Gln Gly Phe
         195                 200                 205
Ser Leu Phe Pro Val Ile Gly Ala Pro Ala Gln Asn Glu Ile Lys Glu
     210                 215                 220
Val Glu Ile Gly Lys Asn Ala Asn Leu Thr Cys Ser Ala Cys Phe Gly
225                 230                 235                 240
Lys Gly Thr Gln Phe Leu Ala Ala Val Leu Trp Gln Leu Asn Gly Thr
                 245                 250                 255
Lys Ile Thr Asp Phe Gly Glu Pro Arg Ile Gln Gln Glu Glu Gly Gln
             260                 265                 270
Asn Gln Ser Phe Ser Asn Gly Leu Ala Cys Leu Asp Met Val Leu Arg
         275                 280                 285
Ile Ala Asp Val Lys Glu Glu Asp Leu Leu Leu Gln Tyr Asp Cys Leu
     290                 295                 300
Ala Leu Asn Leu His Gly Leu Arg Arg His Thr Val Arg Leu Ser Arg
305                 310                 315                 320
Lys Asn Pro Ile Asp His His Ser Ile Tyr Cys Ile Ile Ala Val Cys
                 325                 330                 335
Ser Val Phe Leu Met Leu Ile Asn Val Leu Val Ile Ile Leu Lys Met
             340                 345                 350
Phe Trp Ile Glu Ala Thr Leu Leu Trp Arg Asp Ile Ala Lys Pro Tyr
         355                 360                 365
Lys Thr Arg Asn Asp Gly Lys Leu Tyr Asp Ala Tyr Val Val Tyr Pro
     370                 375                 380
Arg Asn Tyr Lys Ser Ser Thr Asp Gly Ala Ser Arg Val Glu His Phe
385                 390                 395                 400
Val His Gln Ile Leu Pro Asp Val Leu Glu Asn Lys Cys Gly Tyr Thr
                 405                 410                 415
Leu Cys Ile Tyr Gly Arg Asp Met Leu Pro Gly Glu Asp Val Val Thr
             420                 425                 430
Ala Val Glu Thr Asn Ile Arg Lys Ser Arg Arg His Ile Phe Ile Leu
         435                 440                 445
Thr Pro Gln Ile Thr His Asn Lys Glu Phe Ala Tyr Glu Gln Glu Val
     450                 455                 460
Ala Leu His Cys Ala Leu Ile Gln Asn Asp Ala Lys Val Ile Leu Ile
465                 470                 475                 480
Glu Met Glu Ala Leu Ser Glu Leu Asp Met Leu Gln Ala Glu Ala Leu
                 485                 490                 495
Gln Asp Ser Leu Gln His Leu Met Lys Val Gln Gly Thr Ile Lys Trp
             500                 505                 510
Arg Glu Asp His Ile Ala Asn Lys Arg Ser Leu Asn Ser Lys Phe Trp
         515                 520                 525
Lys His Val Arg Tyr Gln Met Pro Val Pro Ser Lys Ile Pro Arg Lys
     530                 535                 540
Ala Ser Ser Leu Thr Pro Leu Ala Ala Gln Lys Gln
545                 550                 555
```

<210> 9
<211> 328
<212> PRT
<213> Homo sapiens

<400> 9

```
Met Gly Phe Trp Ile Leu Ala Ile Leu Thr Ile Leu Met Tyr Ser Thr
 1               5                  10                  15
Ala Ala Lys Phe Ser Lys Gln Ser Trp Gly Leu Glu Asn Glu Ala Leu
            20                  25                  30
Ile Val Arg Cys Pro Arg Gln Gly Lys Pro Ser Tyr Thr Val Asp Trp
        35                  40                  45
Tyr Tyr Ser Gln Thr Asn Lys Ser Ile Pro Thr Gln Glu Arg Asn Arg
    50                  55                  60
Val Phe Ala Ser Gly Gln Leu Leu Lys Phe Leu Pro Ala Glu Val Ala
65                  70                  75                  80
Asp Ser Gly Ile Tyr Thr Cys Ile Val Arg Ser Pro Thr Phe Asn Arg
                85                  90                  95
Thr Gly Tyr Ala Asn Val Thr Ile Tyr Lys Lys Gln Ser Asp Cys Asn
            100                 105                 110
Val Pro Asp Tyr Leu Met Tyr Ser Thr Val Ser Gly Ser Glu Lys Asn
        115                 120                 125
Ser Lys Ile Tyr Cys Pro Thr Ile Asp Leu Tyr Asn Trp Thr Ala Pro
    130                 135                 140
Leu Glu Trp Phe Lys Asn Cys Gln Ala Leu Gln Gly Ser Arg Tyr Arg
145                 150                 155                 160
Ala His Lys Ser Phe Leu Val Ile Asp Asn Val Met Thr Glu Asp Ala
                165                 170                 175
Gly Asp Tyr Thr Cys Lys Phe Ile His Asn Glu Asn Gly Ala Asn Tyr
            180                 185                 190
Ser Val Thr Ala Thr Arg Ser Phe Thr Val Lys Asp Glu Gln Gly Phe
        195                 200                 205
Ser Leu Phe Pro Val Ile Gly Ala Pro Ala Gln Asn Glu Ile Lys Glu
    210                 215                 220
Val Glu Ile Gly Lys Asn Ala Asn Leu Thr Cys Ser Ala Cys Phe Gly
225                 230                 235                 240
Lys Gly Thr Gln Phe Leu Ala Ala Val Leu Trp Gln Leu Asn Gly Thr
                245                 250                 255
Lys Ile Thr Asp Phe Gly Glu Pro Arg Ile Gln Gln Glu Glu Gly Gln
            260                 265                 270
Asn Gln Ser Phe Ser Asn Gly Leu Ala Cys Leu Asp Met Val Leu Arg
        275                 280                 285
Ile Ala Asp Val Lys Glu Glu Asp Leu Leu Leu Gln Tyr Asp Cys Leu
    290                 295                 300
Ala Leu Asn Leu His Gly Leu Arg Arg His Thr Val Arg Leu Ser Arg
305                 310                 315                 320
Lys Asn Pro Ser Lys Glu Cys Phe
                325
```

<210> 10
<211> 1680
<212> DNA
<213> Homo sapiens

<400> 10

```
cttagctccg tcactgactc caagttcatc ccctctgtct ttcagtttgg ttgagatata      60
ggctactctt cccaactcag tcttgaagag tatcaccaac tgcctcatgt gtggtgacct     120
tcactgttgt atgccagtga ctcatctgga gtaatctcaa caacgagtta ccaatacttg     180
ctcttgattg ataaacagaa tggggttttg gatcttagca attctcacaa ttctcatgta     240
ttccacagca gcaaagttta gtaaacaatc atggggcctg gaaaatgagg ctttaattgt     300
aagatgtcct agacaaggaa aacctagtta caccgtggat tggtattact cacaaacaaa     360
```

```
caaaagtatt cccactcagg aaagaaatcg tgtgtttgcc tcaggccgac ttctgaagtt     420
tctaccagct gaagttgctg attctggtat ttatacctgt attgtcagaa gtcccacatt     480
caataggact ggatatgcga atgtcaccat atataaaaaa caatcagatt gcaatgttcc     540
agattatttg atgtattcaa cagtatctgg atcagaaaaa aattccaaaa tttattgtcc     600
taccattgac ctctacaact ggacagcacc tcttgagtgg tttaagaatt gtcaggctct     660
tcaaggatca aggtacaggg cgcacaagtc atttttggtc attgataatg tgatgactga     720
ggacgcaggt gattacacct gtaaatttat acacaatgaa aatggagcca attatagtgt     780
gacggcgacc aggtccttca cggtcaaggt ttggtgtcag agtttctgca aattaaaaaa     840
gagcttaatc tttagtaata ctcattggat tcaaagtcta atgagaggct ttgtgatggt     900
atactatggt gtacataaat gttgtcgagt ggtttttaat ctttgtttgc aatactttca     960
acatcatcaa tggccttgaa tgagcaaggc ttttctctgt ttccagtaat cggagcccct    1020
gcacaaaatg aaataaagga agtggaaatt ggaaaaaacg caaacctaac ttgctctgct    1080
tgttttggaa aaggcactca gttcttggct gccgtcctgt ggcagcttaa tggaacaaaa    1140
attacagact ttggtgaacc aagaattcaa caagaggaag ggcaaaatca aagtttcagc    1200
aatgggctgg cttgtctaga catggtttta agaatagctg acgtgaagga agaggattta    1260
ttgctgcagt acgactgtct ggccctgaat ttgcatggct tgagaaggca caccgtaaga    1320
ctaagtagga aaaatccaag taaggagtgt ttctgagact ttgatcacct gaactttctc    1380
tagcaagtgt aagcagaatg gagtgtggtt ccaagagatc catcaagaca atgggaatgg    1440
cctgtgccat aaaatgtgct tctcttcttc gggatgttgt ttgctgtctg atctttgtag    1500
actgttcctg tttgctggga gcttctctgc tgcttaaatt gttcgtcctc ccccactccc    1560
tcctatcgtt ggtttgtcta gaacactcag ctgcttcttt ggtcatcctt gttttctaac    1620
tttatgaact ccctctgtgt cactgtatgt gaaaggaaat gcaccaacaa ccgaaaactg    1680
```

<210> 11
<211> 259
<212> PRT
<213> Homo sapiens

<400> 11

```
Met Gly Phe Trp Ile Leu Ala Ile Leu Thr Ile Leu Met Tyr Ser Thr
 1               5                  10                  15
Ala Ala Lys Phe Ser Lys Gln Ser Trp Gly Leu Glu Asn Glu Ala Leu
            20                  25                  30
Ile Val Arg Cys Pro Arg Gln Gly Lys Pro Ser Tyr Thr Val Asp Trp
        35                  40                  45
Tyr Tyr Ser Gln Thr Asn Lys Ser Ile Pro Thr Gln Glu Arg Asn Arg
    50                  55                  60
Val Phe Ala Ser Gly Arg Leu Leu Lys Phe Leu Pro Ala Glu Val Ala
65                  70                  75                  80
Asp Ser Gly Ile Tyr Thr Cys Ile Val Arg Ser Pro Thr Phe Asn Arg
                85                  90                  95
Thr Gly Tyr Ala Asn Val Thr Ile Tyr Lys Lys Gln Ser Asp Cys Asn
            100                 105                 110
Val Pro Asp Tyr Leu Met Tyr Ser Thr Val Ser Gly Ser Glu Lys Asn
        115                 120                 125
Ser Lys Ile Tyr Cys Pro Thr Ile Asp Leu Tyr Asn Trp Thr Ala Pro
    130                 135                 140
Leu Glu Trp Phe Lys Asn Cys Gln Ala Leu Gln Gly Ser Arg Tyr Arg
145                 150                 155                 160
Ala His Lys Ser Phe Leu Val Ile Asp Asn Val Met Thr Glu Asp Ala
                165                 170                 175
Gly Asp Tyr Thr Cys Lys Phe Ile His Asn Glu Asn Gly Ala Asn Tyr
            180                 185                 190
Ser Val Thr Ala Thr Arg Ser Phe Thr Val Lys Val Trp Cys Gln Ser
        195                 200                 205
Phe Cys Lys Leu Lys Lys Ser Leu Ile Phe Ser Asn Thr His Trp Ile
    210                 215                 220
Gln Ser Leu Met Arg Gly Phe Val Met Val Tyr Tyr Gly Val His Lys
225                 230                 235                 240
Cys Cys Arg Val Val Phe Asn Leu Cys Leu Gln Tyr Phe Gln His His
                245                 250                 255
```

Gln Trp Pro

<210> 12
<211> 1210
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (84)...(557)

<400> 12

```
gtcgacccac gcgtccgccc acgcgtccgc tggagtaatc tcaacaacga gttaccaata     60
cttgctcttg attgataaac aga atg ggg ttt tgg atc tta gca att ctc aca    113
                          Met Gly Phe Trp Ile Leu Ala Ile Leu Thr
                           1               5                  10

att ctc atg tat tcc aca gca gca aag ttt agt aaa caa tca tgg ggc      161
Ile Leu Met Tyr Ser Thr Ala Ala Lys Phe Ser Lys Gln Ser Trp Gly
                 15                  20                  25

ctg gaa aat gag gct tta att gta aga tgt cct aga caa gga aaa cct      209
Leu Glu Asn Glu Ala Leu Ile Val Arg Cys Pro Arg Gln Gly Lys Pro
             30                  35                  40

agt tac acc gtg gat tgg tat tac tca caa aca aac aaa agt att ccc      257
Ser Tyr Thr Val Asp Trp Tyr Tyr Ser Gln Thr Asn Lys Ser Ile Pro
         45                  50                  55

act cag gaa aga aat cgt gtg ttt gcc tca ggc caa ctt ctg aag ttt      305
Thr Gln Glu Arg Asn Arg Val Phe Ala Ser Gly Gln Leu Leu Lys Phe
     60                  65                  70

cta cca gct gca gtt gct gat tct ggt att tat acc tgt att gtc aga      353
Leu Pro Ala Ala Val Ala Asp Ser Gly Ile Tyr Thr Cys Ile Val Arg
 75                  80                  85                  90

agt ccc aca ttc aat agg act gga tat gcg aat gtc acc ata tat aaa      401
Ser Pro Thr Phe Asn Arg Thr Gly Tyr Ala Asn Val Thr Ile Tyr Lys
                 95                 100                 105

aaa caa tca gat tgc aat gtt cca gat tat ttg atg tat tca aca gta      449
Lys Gln Ser Asp Cys Asn Val Pro Asp Tyr Leu Met Tyr Ser Thr Val
             110                 115                 120

tct gga tca gaa aaa aat tcc aaa att tat tgt cct acc att gac ctc      497
Ser Gly Ser Glu Lys Asn Ser Lys Ile Tyr Cys Pro Thr Ile Asp Leu
         125                 130                 135

tac aac tgg aca gca cct ctt gag tgg ttt aag atg agc aag gct ttt      545
Tyr Asn Trp Thr Ala Pro Leu Glu Trp Phe Lys Met Ser Lys Ala Phe
    140                 145                 150

ctc tgt ttc cag taatcggagc ccctgcacaa aatgaaataa aggaagtgga          597
Leu Cys Phe Gln
155

aattggcact cagttcttgg ctgccgtcct gtggcagctt aatggaacaa aaattacaga    657
ctttggtgaa ccaagaattc aacaagagga agggcaaaat caaagtttca gcaatgggct    717
ggcttgtcta gacatggttt taagaatagc tgacgtgaag gaagaggatt tattgctgca    777
```

```
gtacgactgt ctggccctga atttgcatgg cttgagaagg cacaccgtaa gactaagtag    837
gaaaaatcca agtaaggagt gtttctgaga ctttgatcac ctgaactttc tctagcaagt    897
gtaagcagaa tggagtgtgg ttccaagaga tccatcaaga caatgggaat ggcctgtgcc    957
ataaaatgtg cttctcttct tcgggatgtt gtttgctgtc tgatctttgt agactgttcc   1017
tgtttgctgg gagcttctct gctgcttaaa ttgttcgtcc tcccccactc cctcctatcg   1077
ttggtttgtc tagaacactc agctgcttct ttggtcatcc ttgttttcta actttatgaa   1137
ctcctctgt gtcactgtat gtgaaaggaa atgcaccaac aaccgtaaaa aaaaaaaaaa   1197
aagggcggcc gct                                                     1210
```

<210> 13
<211> 158
<212> PRT
<213> Homo sapiens

<400> 13

```
Met Gly Phe Trp Ile Leu Ala Ile Leu Thr Ile Leu Met Tyr Ser Thr
 1               5                  10                  15
Ala Ala Lys Phe Ser Lys Gln Ser Trp Gly Leu Glu Asn Glu Ala Leu
            20                  25                  30
Ile Val Arg Cys Pro Arg Gln Gly Lys Pro Ser Tyr Thr Val Asp Trp
        35                  40                  45
Tyr Tyr Ser Gln Thr Asn Lys Ser Ile Pro Thr Gln Glu Arg Asn Arg
    50                  55                  60
Val Phe Ala Ser Gly Gln Leu Leu Lys Phe Leu Pro Ala Ala Val Ala
65                  70                  75                  80
Asp Ser Gly Ile Tyr Thr Cys Ile Val Arg Ser Pro Thr Phe Asn Arg
                85                  90                  95
Thr Gly Tyr Ala Asn Val Thr Ile Tyr Lys Lys Gln Ser Asp Cys Asn
            100                 105                 110
Val Pro Asp Tyr Leu Met Tyr Ser Thr Val Ser Gly Ser Glu Lys Asn
        115                 120                 125
Ser Lys Ile Tyr Cys Pro Thr Ile Asp Leu Tyr Asn Trp Thr Ala Pro
    130                 135                 140
Leu Glu Trp Phe Lys Met Ser Lys Ala Phe Leu Cys Phe Gln
145                 150                 155
```

<210> 14
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> sense primer

<400> 14

```
ttgccataga gagacctc                                                18
```

<210> 15
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> antisense primer

<400> 15

```
tgctgtccaa ttatacagg                                               19
```

<210> 16
<211> 22
<212> DNA

<213> Artificial Sequence

<220>
<223> sense primer

<400> 16
gaacacggca ttgtcactaa ct 22

<210> 17
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> antisense primer

<400> 17
cctcatagat gggcactgtg t 21

<210> 18
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> forward primer

<400> 18
tgtgacggcg accaggt 17

<210> 19
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> reverse primer

<400> 19
tctctgtttc cagtaatcgg agc 23

<210> 20
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> TaqMan probe

<400> 20
ttcacggtca aggatgagca agcctt 26

<210> 21
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> forward primer

<400> 21

caccccccact gaaaaagatg a 21

<210> 22
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> reverse primer

<400> 22
cttaactatc ttgggctgtg acaaag 26

<210> 23
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> TaqMan probe

<400> 23
tatgcctgcc gtgtgaacca cgtg 24

<210> 24
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> 5' oligonucleotide

<400> 24
ccgcgggtac cagtaaatcg tcctggggtg g 31

<210> 25
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> 3' oligonucleotide

<400> 25
aaataaagga tccctacatc cagcaactat gtagta 36

<210> 26
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> 5' oligonucleotide

<400> 26
gaacacacta gtactatcct gtgccattgc catagaga 38

<210> 27
<211> 44
<212> DNA
<213> Artificial Sequence

<220>
<223> 3' oligonucleotide

<400> 27
ggaatattgg gcccttggat cccaagtctg cacacctgca ctcc 44

<210> 28
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> 5' oligonucleotide

<400> 28
gtaaatcgtc ctggggtctg g 21

<210> 29
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> 3' oligonucleotide

<400> 29
ccttctgata acacaagcat aaatc 25

<210> 30
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 30
acggagggca gtaaatc 17

<210> 31
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 31
cagccaagaa gtgagagc 18

<210> 32
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 32
tgttgccgga atccagcctc ag 22

<210> 33
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 33
gtcccccacc cccagataca acc 23

<210> 34
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> linker

<400> 34
Ala Ala Ala Asp Pro
1 5